

## CLAIMS

We claim:

1. A method for merging design intent of multiple designers with respect to a digital model of an object, the method comprising:

receiving data concerning a change to the digital model over a network, the change to the digital model being performed by a first designer;

analyzing the data concerning the change performed by the first designer and data concerning a digital model version created by a second designer; and

integrating the change performed by the first designer into the digital model version created by the second designer.

2. The method of claim 1 wherein the data concerning the change performed by the first designer includes an identifier of a design feature being modified and a set of parameters associated with the design feature.

3. The method of claim 2 wherein the set of parameters includes one or more behavioral parameters of the design feature.

4. The method of claim 1 wherein the data concerning the change performed by the first designer further includes a functional object representation of a digital model version created by the first designer.

5. The method of claim 1 wherein the data concerning the digital model version created by the second designer includes a functional object representation (FOR) of the digital model version.

6. The method of claim 5 wherein the FOR includes a predefined set of body partitions with corresponding contributing volumes and links to design features of the digital model.

7. The method of claim 6 further comprising:  
maintaining a database storing the FOR of the digital model and data characterizing each design feature of the digital model.

8. The method of claim 7 wherein the data characterizing each design feature includes information uniquely identifying said each design feature by the time and location associated with creation of said each design feature.

9. The method of claim 7 wherein the data characterizing each design feature includes information identifying one or more designers who contributed in the design of said each design feature.

10. The method of claim 7 wherein the data characterizing each design feature includes information identifying one or more designers who defined associations between said each design feature and any other design feature of the digital model.

11. The method of claim 1 further comprising:  
receiving a request of the second designer to inform the first designer about a change performed by the second designer with respect to the digital model;  
extracting data concerning the change performed by the second designer; and  
sending the extracted data with an identifier of a destination client device to a server over the network, the destination client device being used by the first designer.

12. The method of claim 11 wherein the request specifies which design feature was modified.

13. The method of claim 11 wherein the request asks for all changes to the digital model that occurred between the time of the request and the time of a last transmission of changes to the destination device.

14. The method of claim 11 wherein the request does not permit the first designer to modify any design element sent by the second designer.

15. The method of claim 11 wherein each change to the digital model is communicated between the first designer and the second designer as soon as said change is performed.

16. The method of claim 11 wherein changes to the digital model are communicated between the first designer and the second designer asynchronously.

17. An apparatus for merging design intent of multiple designers with respect to a digital model of an object, the apparatus comprising:

a data receiver to receive data concerning a change to the digital model over a network, the change to the digital model being performed by a first designer; and

a data merger to analyze the data concerning the change performed by the first designer and data concerning a digital model version created by a second designer, and to integrate the change performed by the first designer into the digital model version created by the second designer.

18. The apparatus of claim 17 wherein the data concerning the change performed by the first designer includes an identifier of a design feature being modified and a set of parameters associated with the design feature.

19. The apparatus of claim 18 wherein the set of parameters includes one or more behavioral parameters of the design feature.

20. The apparatus of claim 17 wherein the data concerning the change performed by the first designer further includes a functional object representation of a digital model version created by the first designer.

21. The apparatus of claim 17 wherein the data concerning the digital model version created by the second designer includes a functional object representation (FOR) of the digital model version.

22. The apparatus of claim 21 wherein the FOR includes a predefined set of body partitions with corresponding contributing volumes and links to design features of the digital model.

23. The apparatus of claim 22 further comprising a database to store the FOR of the digital model and data characterizing each design feature of the digital model.

24. The apparatus of claim 23 wherein the data characterizing each design feature includes information uniquely identifying said each design feature by the time and location associated with creation of said each design feature.

25. The apparatus of claim 23 wherein the data characterizing each design feature includes information identifying one or more designers who contributed in the design of said each design feature.

26. The apparatus of claim 23 wherein the data characterizing each design feature includes information identifying one or more designers who defined associations between said each design feature and any other design feature of the digital model.

27. The apparatus of claim 17 further comprising:  
a data supplier to receive a request of the second designer to inform the first designer about a change performed by the second designer with respect to the digital model, to extract data concerning the change performed by the second designer, and to send the extracted data with an identifier of a destination client device to a server over the network, the destination client device being used by the first designer.

28. The apparatus of claim 27 wherein the request specifies which design feature was modified.

29. The apparatus of claim 27 wherein the request asks for all changes to the digital model that occurred between the time of the request and the time of a last transmission of changes to the destination device.

30. The apparatus of claim 27 wherein the request does not permit the first designer to modify any design element sent by the second designer.

31. The apparatus of claim 27 wherein each change to the digital model is communicated between the first designer and the second designer as soon as said change is performed.

32. The apparatus of claim 27 wherein changes to the digital model are communicated between the first designer and the second designer asynchronously.

33. A system for merging design intent of multiple designers with respect to a digital model of an object, the system comprising:

means for receiving data concerning a change to the digital model over a network, the change to the digital model being performed by a first designer;

means for analyzing the data concerning the change performed by the first designer and data concerning a digital model version created by a second designer;  
and

means for integrating the change performed by the first designer into the digital model version created by the second designer.

34. A computer readable medium comprising executable instructions which when executed on a processing system cause said processing system to perform a method comprising:

receiving data concerning a change to the digital model over a network, the change to the digital model being performed by a first designer;

analyzing the data concerning the change performed by the first designer and data concerning a digital model version created by a second designer; and

integrating the change performed by the first designer into the digital model version created by the second designer.